

Math 2010 Survey of Calculus

Instructor:

Phone:

E-mail:

Office Hours:

Office:

Course Description:

We study concepts of differential and integral calculus with emphasis on applications in business and in the biological and social sciences. Topics include optimization, marginal analysis, and exponential growth models. A graphing calculator is required.

Prerequisites: MATH 1100 with a grade of C or better

Text: Wright, Hurd and New. *Essential Calculus*, 2nd Edition, Hawkes Learning Systems. ISBN: 978-0-918091-95-6 (Textbook and /or bundle)

Supplies: TI-83 or TI-84 Graphing Calculator.

Course Goals:

Students will acquire a fundamental understanding of the basic concepts of integral and differential calculus from four perspectives: algebraic, numeric, graphic, and verbal and will be able to solve a variety of applied problems using calculus concept and techniques. They will improve their critical thinking, communication, and problem-solving skills while developing an appreciation for the power of mathematics and its relevancy in their lives. Students will be able to transfer this course to four-year institutions to fulfill part of the mathematics requirement in various fields such as business, biology, and industrial technology.

Course Objectives:

Upon successful completion of this course, the student will be able to

- demonstrate an understanding of a variety of functions, including linear, exponential, power, logarithmic, and polynomial and their applications to various fields;
 - demonstrate an understanding of the derivative and its interpretations, including slope of a tangent line;
- use formulas to find the derivatives of a variety of functions;
- use the derivative to describe the shape of a graph and to solve optimization problems;
- demonstrate an understanding of the definite integral and its interpretations, including area, average value, and total change;
- evaluate definite integrals using numerical approximation techniques and the Fundamental Theorem of Calculus.

Course Content/Outline (from the course textbook):

1.6a An Introduction to Functions
1.6b Operations with Functions
2.1a Left and Right Hand Limits
2.1b Limits
2.2a Average Rate of Change
2.2b Instantaneous Rate of Change and Interpreting Graphs
2.3a Definition of the Derivative and Power Rule
2.3b Slope and Rate of Change Considered Algebraically
2.4 Applications: Marginal Analysis
3.1 Product and Quotient Rules
3.2 The Chain Rule and the General Power Rule
3.3 Implicit Differentiation and Related Rates
3.4a Local Extrema
3.4b Critical Points and the First Derivative Test

3.5 Absolute Maximum and Minimum
4.1a Higher Order Derivatives and Concavity
4.1b Higher Order Derivatives: the Second Derivative Test
4.4 Business Applications
5.1 Exponential Functions
5.2 The Algebra of the Natural Logarithm Function
5.3 Differentiation of Logarithmic Functions
5.4 Differentiation of Exponential Functions
6.1 The Indefinite Integral
6.2 Integration by Substitution
6.3a The Fundamental Theorem of Calculus
6.3b The Definite Integral

Assessment:

There will be four non-final exams and a comprehensive final exam. Each exam is worth 20 possible points. This gives a course total of 100 possible points. **NO EARLY EXAMS OR MAKE-UP EXAMS WILL BE GIVEN UNDER ANY CIRCUMSTANCES.** The final exam will replace the lowest of the four non-final exam scores, but only if it helps your grade. For example, suppose your 4 non-final exam scores are 16, 0, 17, 18, and your final exam score is 19. Then your new 4 non-final exam scores would be 16, 19, 17, and 18, and your final exam score would be 19. Failure to take the final exam on the assigned date and time will result in a 0 for the the final exam score. The grading scale is as follows: A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: 0-59. Homework will be assigned regularly, but will not be graded.

Exam Dates:

Reading and Writing Across the Curriculum:

The Final Exam will contain a writing component that satisfies the SLCC policy on **Reading and Writing Across the Curriculum.**

Attendance Policy:

Attendance is monitored, but will not affect your grade. Additional examples will be presented in class, so it is beneficial to attend class regularly.

Students with Disabilities:

Students with disabilities who may require assistance or accommodation or with questions related to any accommodation for testing, note takers, readers, etc., should contact the instructor as soon as possible. Students may also contact the Dean of Students with questions about such services.

Emergency Evacuation Procedure:

A map is posted in the front of the building marking the evacuation route and the Designated Rescue Area. This is an area where emergency service personnel will go first to look for individuals who need assistance in exiting the building. Students who may need assistance should identify themselves to the teaching faculty.